PHOTOFACT® Folder

CONCORD
MODEL 103

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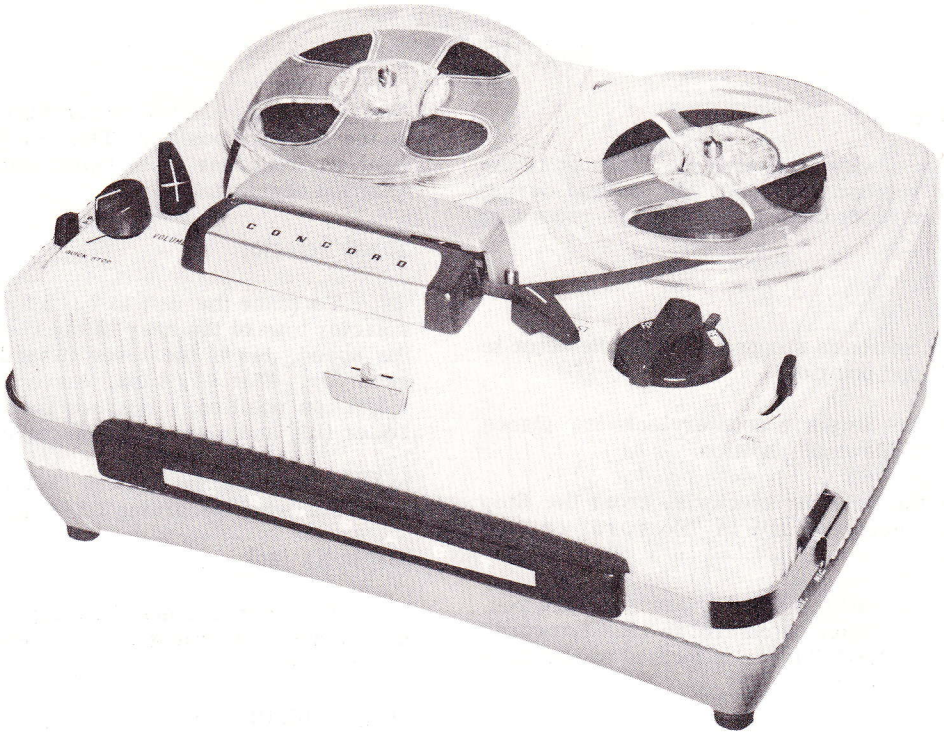


CONCORD
MODEL 103

GENERAL INFORMATION

The Concord Model 103 is a three-speed, dual-track tape recorder.

Recordings can be made directly from a microphone and from a radio, phonograph, or television receiver.

The three tape speeds are 1 7/8, 3 3/4 and 7 1/2 ips. The playing and recording time using both tracks are as follows:

Reel Size	1 7/8 ips	3 3/4 ips	7 1/2 ips
3" (300 ft.)	1 hour	1/2 hour	1/4 hour
5" (600 ft.)	2 hours	1 hour	1/2 hour

Connect recorder to an outlet supplying 110-120 volts, 60 cycles AC only. Before connecting to line supply, be certain it agrees with these specifications.

Supplied By:

Concord Electronics Corp.
1549 North Vine Street
Los Angeles, California

HOWARD W. SAMS & CO., INC. Indianapolis 6, Indiana

SET 539 FOLDER 8

PREPARING FOR OPERATION

1. Remove the lid from the case.
2. Remove the AC cord and accessories from the accessory bag.
3. Plug the AC cord into a convenient outlet of proper power rating.
4. Recorder is now ready for use. Before operating, the operator should familiarize himself with the function of the controls.

FUNCTION OF CONTROLS

On-Off-Volume

Turn knob clockwise to turn the power on to the unit. Further rotation increases the volume during playback. When recording, it controls the recording level.

Selector

1. The tape motion is stopped when the Selector is in the "Stop" position.
2. Turning the Selector counterclockwise places the unit in "Rewind" position.
3. Turning the Selector clockwise from the Stop position places the unit in "Forward" or Play position.
4. To Record, pull the "REC." lever toward you, then turn the Selector control to the "Forward" position. ("REC." lever is located to the right of Selector knob).

Fast Forward

Turn Selector to Forward (Play) position and then move the Fast Forward lever toward the front of the case to advance the tape rapidly.

Quick Stop

When the lever is pulled toward the front of the case it will stop the forward motion of the tape temporarily without turning off the amplifier or motor circuits.

REC. Safety

To record, move the REC. Safety Lever toward the front of the case before turning the Selector control to the Forward position. This is a Safety Lock to prevent the recorder from being placed in the Record position accidentally.

Speed Selector

To place the unit in 7 1/2 ips speed, move the selector toward the rear of the recorder. For 3 3/4 ips speed, move the lever toward the front of the recorder. For 1 7/8 ips, leave the selector in the 3 3/4 ips position. Remove the 7 1/2 ips capstan roller (115) and place it on the capstan holder.

NOTE: Replace the capstan roller on the capstan when recording 3 3/4 ips or 7 1/2 ips.

Earphone Jack

The Earphone may be plugged into this jack for monitoring a recording or for listening to the playback of a recording.

"Ext." Output Jack

This jack is provided for playing the recorder through an external speaker, radio, or Hi Fi amplifier.

"Aux." Radio-Phono Input Jack

This jack is used when recording from a radio, phonograph, or TV.

"Mic." Input Jack

This jack is used when making recordings with the microphone.

OPERATING INSTRUCTIONS

Threading the Tape

1. Move the Selector control to the "Stop" position.
2. Place a reel of tape on the left-hand reel spindle (76).
3. Place an empty reel on the right-hand reel spindle (15).
4. Unwind about 12" of tape from the reel. Hold a section taut and insert it in the tape slot. Make sure the dull-coated side faces the rear of the recorder.
5. Insert the free end of the tape into one of the radial slots of the right-hand spindle reel. Turn the reel several turns counterclockwise to fasten the tape to the reel and to take up slack between reels.

Recording from Microphone

1. Rotate the On-Off-Volume control clockwise to turn the recorder on. Allow sufficient time for the tubes to warm up.
2. Insert the microphone plug into the "Mic." jack.

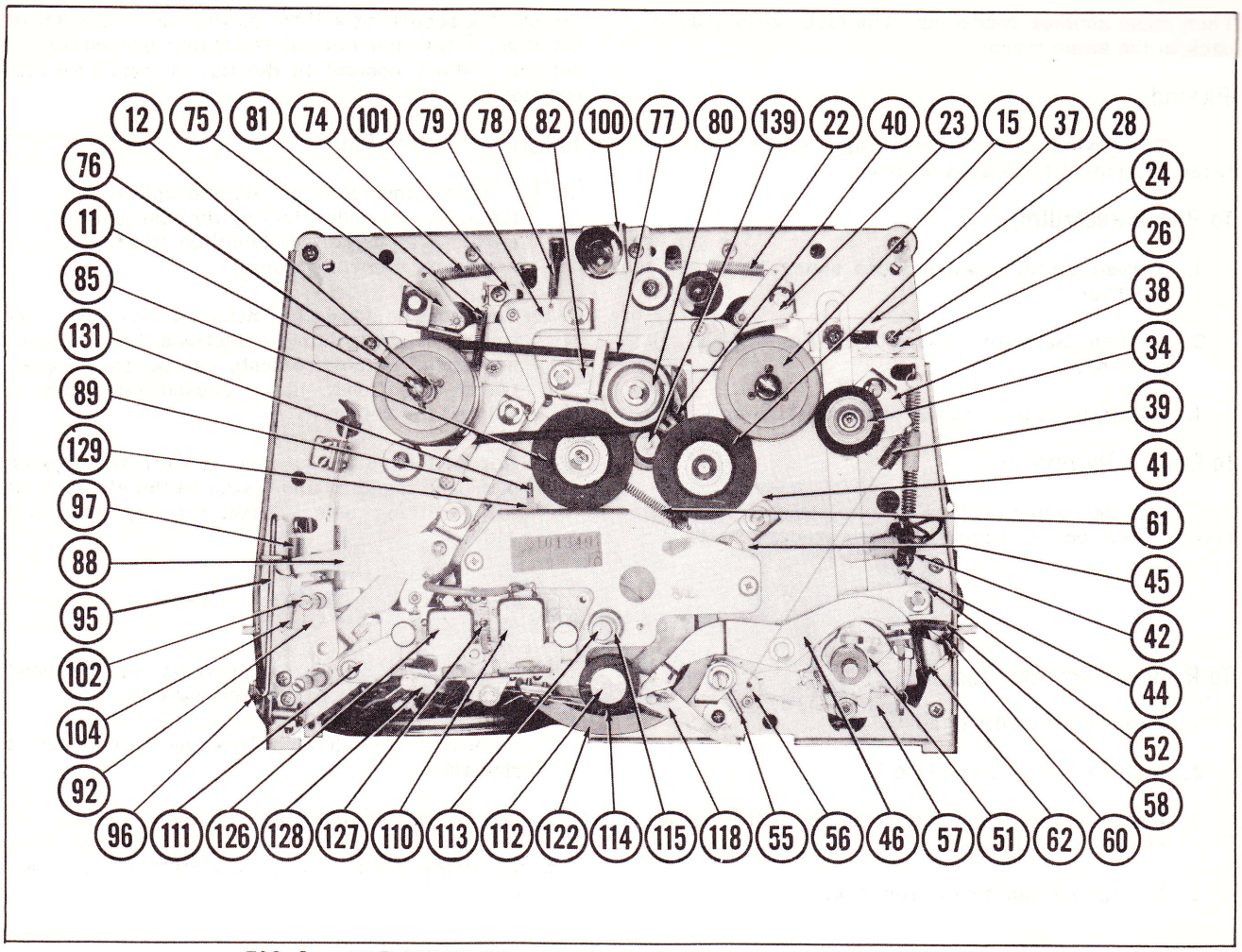


FIG.1 TOP VIEW OF MECHANISM WITH TOP COVER REMOVED

3. Set the speed selector for the desired speed 7 1/2, 3 3/4, or 1 7/8 ips.

4. Pull the "REC." lever toward the front of the case and move the Selector control to the Forward position.

5. Hold the microphone about 6 to 12 inches from the mouth and speak in a normal voice.

6. Adjust the Volume control until the level indicator flashes on the loudest passages.

NOTE: Correct volume level during a recording is very important. Too weak a signal will result in weak playback and high background noise. Too strong a signal will result in distortion during playback.

Recording from a Radio, Phonograph or Television Receiver

Connect the patch cord supplied with the recorder as follows:

1. Connect the alligator clips across the voice coil terminals of the radio, phonograph, or television receiver.

2. Insert the patch cord plug into the Aux. jack.

3. Follow steps 1 thru 4 under "Microphone Recording".

Recording from Cartridge

1. Magnetic Cartridge:

   (a) Connect the output of the cartridge to a preamplifier.

   (b) Connect the preamplifier output to the "Aux." jack of the recorder.

   (c) Follow steps 1 thru 4 under "Microphone Recording".

2. Crystal or Ceramic Cartridge:

   (a) Connect the cartridge leads through the patch cord to the "Aux." jack of the recorder.

   (b) Follow steps 1 thru 4 under "Microphone Recording".

Dual Track Recording

This recorder will record and play on one-half the width of the tape at a time, resulting in a two-track recording. After the first recording is completed, remove the full reel from the right-hand spindle, turn the reel over and place it on the left-hand spindle.

Then make another recording. The tape can be played back in the same manner.

Rewind

To rewind the tape at a rapid speed turn the Selector control to Rewind position.

To Play a Recording

1. Thread the tape as described under "Threading the Tape".
2. Turn the Selector control to the Forward (Play) position.
3. Adjust the volume to the desired listening level.

To Erase a Recording

Any recording on tape is automatically erased before a new one is made when in the record position.

To erase a recording without putting new material on the tape, follow the normal recording procedure but set the volume control to the full counterclockwise position.

To Edit and Splice Tape

NOTE: It is impossible to edit and splice one track tape without effecting the other. Recordings to be edited should be limited to one track recordings only.

1. Tape may be edited by cutting out unwanted portions, or by joining selections into another sequence. Announcements can be inserted between selections, etc. Unused tape can be spliced for reuse.
2. For best results, cut tape at a slight diagonal, butt ends together and fasten on the glossy side with splicing tape. Trim off any excessive width.

DISASSEMBLY

To Remove Recorder from Case

1. Remove all control knobs.
2. Remove head covers (4 & 5).
3. Remove the four rubber feet on the bottom of the case.
4. Lift the bottom cover from case.
5. Remove one long brass colored phillips head screw from front part of the chassis.
6. Remove three other phillips head screws from chassis.
7. Lift recorder from case.
8. To reassemble, reverse the foregoing procedure.

CLEANING

The record head (110), erase head (126), capstan (115), pinch roller (114), and tape guides (106) should be cleaned occasionally to remove the tape residue which is worn off the tape as it passes these parts. Use a soft cloth and alcohol to remove the residue.

Clean the rubber tired idler wheels and belts with alcohol.

LUBRICATION

All rotating parts are provided with oilite bearings and are lubricated before leaving the factory. Under normal use, no lubrication is required for a long period of time. When lubrication is necessary, use a good grade of oil sparingly.

When lubricating the flywheel bearing, remove the capstan (115) and inject 4 or 5 drops of oil.

ADJUSTMENTS

Idler Wheel

To adjust the idler wheel pressure, set the speed selector to 3 3/4 ips. Hook a spring scale to the end of the idler lever (89) and pull until the idler is lifted away from the motor pulley. The spring (61) should be adjusted so that there is between 9 and 12 ounces of pull.

The idler wheel height is adjusted by moving the motor pulley up or down as required. In the 3 3/4 ips position the distance between the lower surface of the idler wheel and the step of the motor pulley should be 3/32". In the 7 1/2 ips position the distance between the upper surface of the idler wheel (85) and the step of the motor pulley (139) must be around 1/32".

Tape Speed and Pinch Roller

(a) Tape Speed — Set the Speed Lever to 7 1/2 ips, and the Selector control to the Forward position. Adjust the hex nut (129) clockwise to increase speed, and counterclockwise to decrease speed.

After adjustment is made, check the 1 7/8 and 3 3/4 ips speeds.

(b) Pinch Roller — To check the pressure of the Pinch Roller (114), set the controls as described under "Tape Speed".

Measure the tension of the pinch roller by hanging the hook of a spring scale to the pinch roller shaft, pull on the scales until

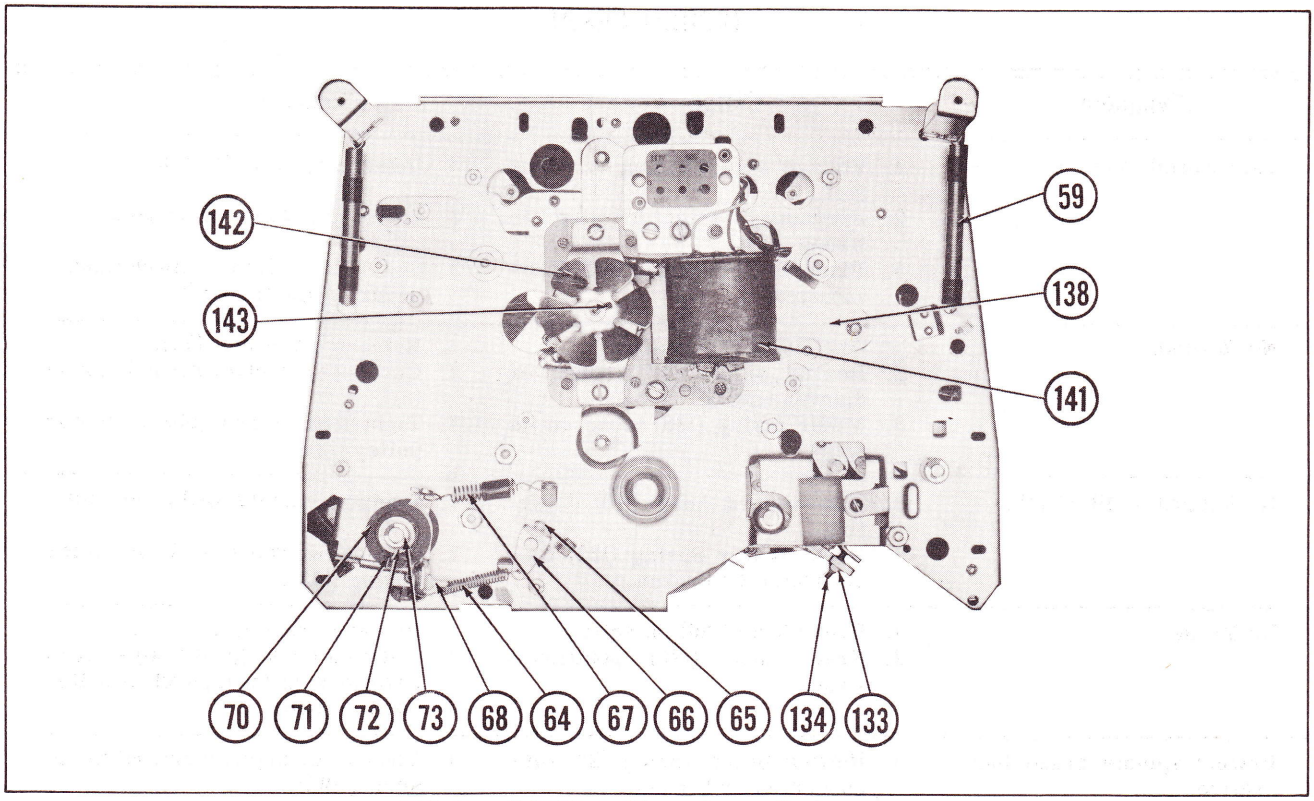


FIG.2 BOTTOM VIEW OF MECHANISM

the pinch roller (114) is lifted away from the Capstan (115), the tension should be between 1 and 2 pounds.

If adjustment is necessary turn the hex nut (129) clockwise to increase tension and counterclockwise to decrease tension. If adjustment was made, the "Tape Speed Adjustment" must be checked.

Pressure Pad

Set the Selector control to Forward Position and turn the Fast Forward lever to Fast Forward.

Adjust the position of the pressure pad retainer (128) by turning retaining screw (134) so the proper distance between the front surface of the pads and the heads (110 and 126) is 1/4". Tighten hex nut (133).

Adjust the angle of lug (124) so pads are parallel to the heads (110 and 126).

Record Switch Arm

When the Recorder is in the record mode the record switch arm (62) is locked against the switch lock arm (52).

The distance between the outer edge of the record switch arm (62) and the switch lock arm (52) protrusion, should be about 1/64 to 3/64 inch.

Adjust screw (68) located on the switch lever (69) and lock it in place with the adjustment nut.

Play-Record Head

Thread a good prerecorded tape on the recorder.

While playing back, adjust the head mounting screws for the proper position of the head which will give maximum output. The adjusting screws must be tight when adjustment is completed.

Erase Head

The erase head (126) should be adjusted so that it effects just the top half of the recorded tape.

This adjustment should be made in Record position. Loosen the erase head adjusting screws, and adjust head to a position where only the top half of the tape will be erased. The adjusting screws must be tight when adjustment is completed.

Record Bias Adjustments

Set the Selector to Record position and tape speed for 3 3/4". Adjust A1 for 45 volts RMS across the Record/ Play head.

Bias Frequency Adjustment

Set the Selector to Record position and adjust A2 for bias frequency of 30KC ± 2KC.

Record Level Indicator Adjustment

Inject a 1000 cycle signal into either Input jack with the Selector set to Record. Adjust R2 until the neon lamp lights with 11 to 15 volts of signal level at pin 6 (plate) of V2 (12AU7).

TROUBLE CHART

Symptom	Cause	Remedy
Tape Speed too fast.	1. Voltage selector plug in wrong jack. 2. Frequency selector plug in wrong jack. 3. Pinch Roller spring (132) misadjusted.	1. Insert plug in 117V jack. 2. Insert plug in 60 cycle jack. 3. See "Pinch Roller Adjustment" under "Adjustments".
No Rewind.	1. Drive belt (77) broken. 2. Rewind spring (81) broken or disconnected. 3. Motor pulley (139) loose on its shaft.	1. Replace drive belt (77). 2. Connect or replace rewind spring (81). 3. Tighten set screw (140) on motor pulley (139).
No Record or Playback.	1. Play-record head (110) defective. 2. Pinch Roller Spring (132) disconnected or broken.	1. Replace Play-record head (110). 2. Connect or replace Pinch Roller spring (132).
No Erase	1. Erase head (126) defective. 2. Erase head (126) positioned wrong.	1. Replace erase head (126). 2. Position erase head (126) so it is parallel with the tape when in Record position.
Rewind spindle brake inoperative.	1. Rewind brake spring (22) disconnected or broken.	1. Connect or replace rewind brake spring (22).
Takeup spindle brake inoperative.	1. Takeup brake spring (74) disconnected or broken.	1. Connect or replace takeup brake spring (74).
Selector switch operates too freely.	1. Interlock spring (54) disconnected or broken.	1. Connect or replace interlock spring (54).

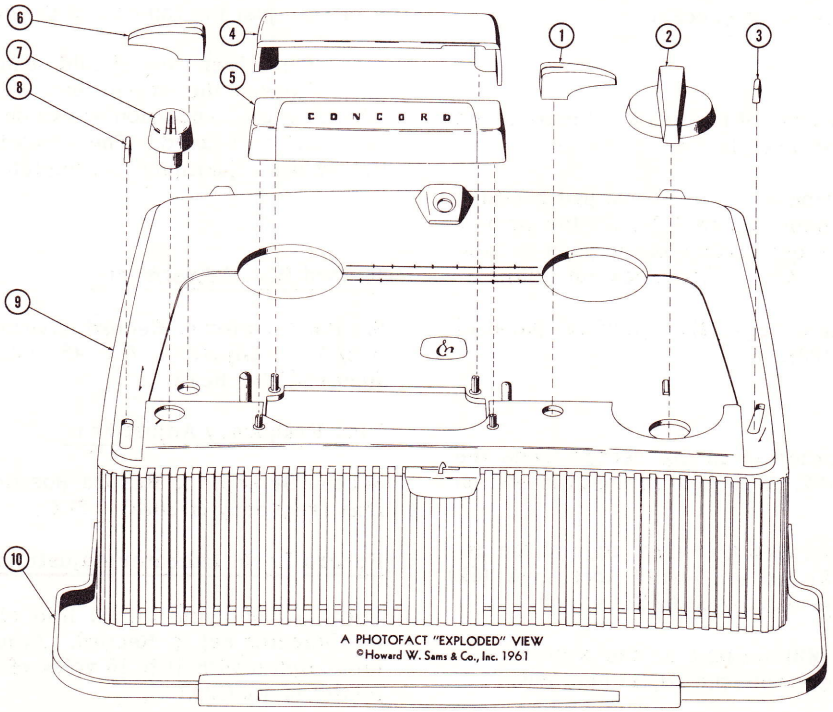


FIG.3A EXPLODED VIEW OF MECHANISM

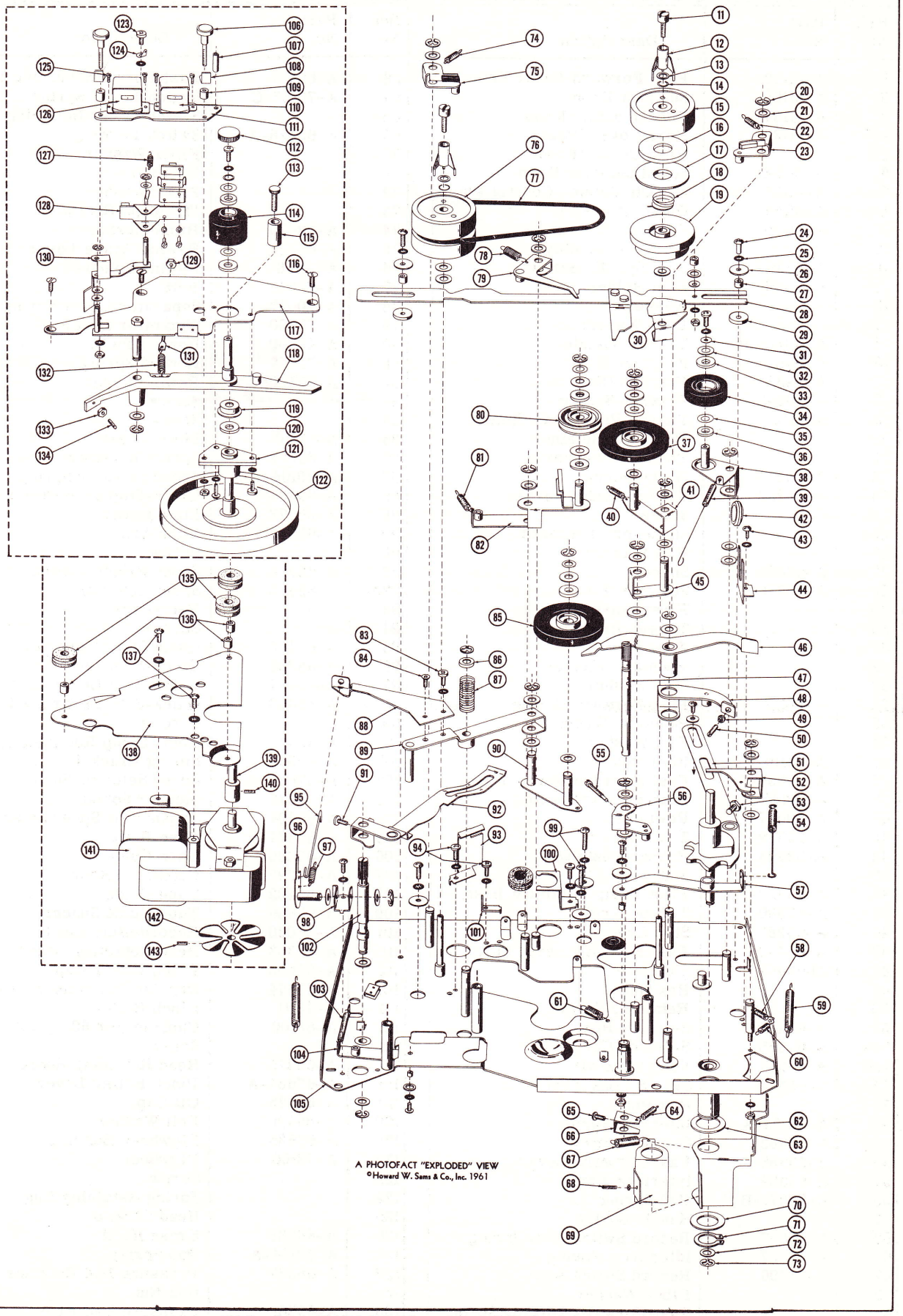


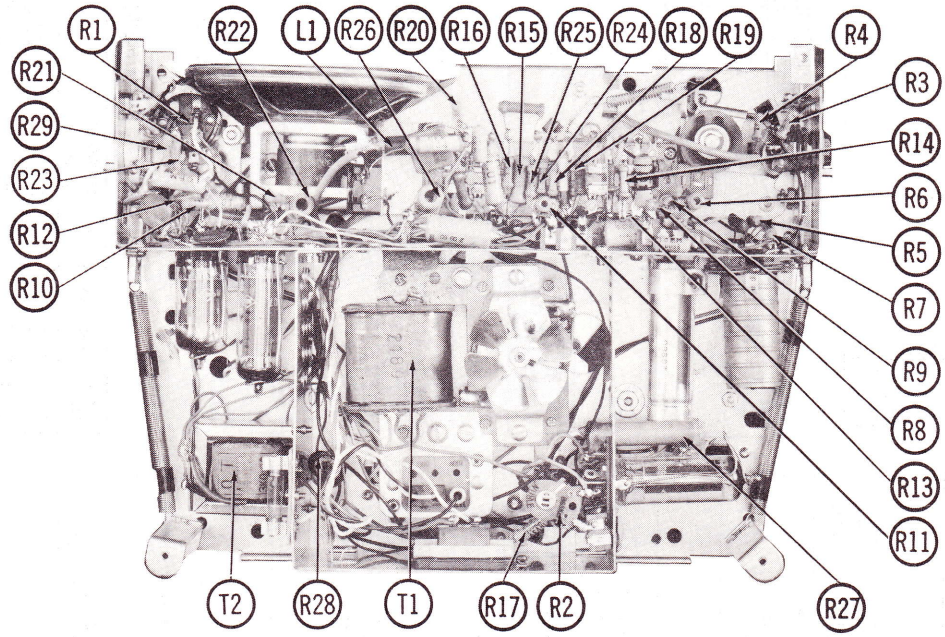
FIG. 3A EXPLODED VIEW OF CABINET

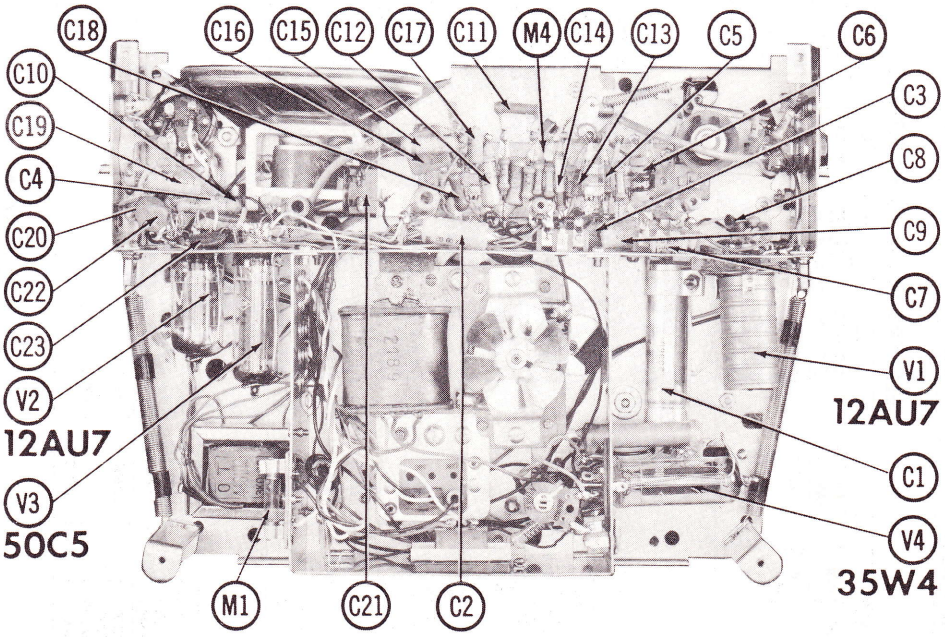
MECHANICAL PARTS LIST

Ref. No.	Part No.	Description
1	A-81152	Fast Forward Lever Knob
2	A-81151	Selector Knob
3	A-81154	Record Safety Knob
4	A-81139	Head Cover (Rear)
5		Head Cover (Front)
6	A-81152	Speed Selector Knob
7	A-81153	On/ Off Volume Control Knob
8	A-81154	Quick-Stop Knob
9	A-81140	Cabinet
10		Handle Assembly
11	A-67397	Reel Spindle Screw
12	A-81055	Reel Holder
13		Washer
14		Lock Washer
15	A-81059-B	Takeup Spindle
16	A-85151	Friction Felt
17	A-64887	Friction Disc
18	A-70048	Friction Spring
19	A-81145	Takeup Reel Drive Spindle
20		"E" Type Retainer
21		Phenolic Washer
22	A-70075	Brake Spring
23	A-65382	Takeup Brake Lever
24		Screw
25		Shake-proof Washer
26		Flat Washer
27	A-67464	Spacer
28	A-65376	Selector Slide
29		Fiber Washer
30		Takeup Brake Cam
31		Washer
32		Phenolic Washer
33		Felt Washer
34	A-48112	Fast Forward Roller
35		Phenolic Washer
36		Felt Washer
37	A-48110	Idler Wheel
38	A-65385-A	Fast Forward Roller Lever
39	A-70143	Fast Forward Spring
40	A-70057	Rewind Spring
41	A-65379	Takeup Arm
42	R-83603	Rubber Bushing
43		Screw
44	A-65398-A	Pilot Lamp Retaining Brkt.
45	A-65380	Takeup Arm
46	A-65381	Stop Lever
47	A-67689	Fast Forward Lever Shaft
48	A-65407	Stop Arm
49		Hex Nut
50		Retaining Screw
51	A-65401	Selector Rod
51A	A-67685	Selector Cam
51B	A-67687	Selector Shaft
52	A-65397	Switch Lock Arm
53		Hex Bolt
54	A-70133-A	Interlock Spring
55	A-67682	Stopper Screw
56	A-65386	Fast Forward Lever
57	A-65384	Interlock Arm
58	A-70071-B	Pad Spring
59		Handle Spring
60	A-70057	Record Switch Arm Spring
61	A-70057	Idler Arm Spring
62	A-65396	Record Switch Arm
63		Fiber Washer
64		Fast Forward Turning Spring
65		Fast Forward Turning Screw
66	A-65415	Fast Forward Turning Lever
67	A-70126-C	Switch Lever Spring
68		Switch Lever Retaining Screw
69	A-65428-A	Switch Lever
70		Fiber Washer
71		Retainer
72		Fiber Washer
73		"E" Type Retainer
74	A-70075	Brake Spring
75	A-65383	Rewind Brake Lever
76	A-81146	Rewind Spindle
77	A-83063	Belt
78	A-70057	Separator Lever Spring
79	A-65390	Separator Lever
80	A-48090	Rewind Pulley
81	A-70057	Rewind Spring
82	A-65400	Rewind Lever
83		Screw
84		Screw
85	A-48110	Idler Wheel
86	A-65062	Spring Retainer
87	A-70104	Speed Selector Spring
88	A-65434	Quick-Stop Supporter Lever
89	A-65378	Idler Lever
90	A-65377	Idler Arm
91		Screw
92	A-65394	Speed Selector Slide
92A	A-65395	Speed Selector Lever
93		Belt Guide
94		Screws
95	A-65405	Quick Stop Connector
96	A-65389	Quick-Stop Lever
97	A-70057	Quick-Stop Lever Spring
98	A-65403	Quick-Stop Lever Holder
99		Screws
100	A-65430	Neon-Lamp Retaining Brkt.
101	A-65368	Spring Bracket
102	A-67688	Speed Selector Shaft
103	A-70075	Stepper Spring
104	A-65404	Stepper for Speed Selector
105	A-65374-B	Base Plate
106	A-67680	Tape Guide
107	A-67393	Capstan Holder
108	A-65402	Tape Guide
109	A-67696	Tape Guide Spacer
110	A-46030	Record-Play Head
111	A-65393	Head Retaining Board
112	A-67698	Pinch Roller Cap
113	A-67674	Capstan Retaining Screw
114	A-48111	Pinch Roller
115	A-68109	Capstan (for 60 cycle)
116		Screw
117	A-65375	Head Retaining Board
118	A-67684-A	Pinch Roller Lever
119	A-65325	Oil Cap
120	A-85490	Felt Washer
121	A-67686	Flywheel Bearing
122	A-48106	Flywheel
123		Screw
124		Spring Retaining Lug
125		Head Screws
126	A-46028	Erase Head
127	A-70134-A	Pad Spring
128	A-65387	Pressure Pad Retainer
129		Hex Nut
130	A-65388	Pressure Pad Arm
131	A-65429	Spring Adjusting Screw

Ref. No.	Part No.	Description
132	A-70122	Pinch Roller Spring
133		Hex Nut
134		Retaining Screw
135	A-83062	Shock Absorbing Rubber Cushion
136	A-67679	Shock Absorbing Rubber Spacer

Ref. No.	Part No.	Description
137		Screw
138	A-65392	Motor Retaining Board
139		Motor Pulley
140		Motor Pulley Set Screw
141	A-48105	Motor
142		Motor Fan
143		Motor Fan Set Screw





AMP CHASSIS-BOTTOM VIEW

CONCORD
MODEL 103

FOLDER 8

ELECT. PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	TYPE (◆ GENERAL ELECTRIC ◆ RAYTHEON ◆ SYLVANIA ◆)
V1	AF Amplifier	12AU7
V2	AF Amplifier	12AU7
V3	Output-Bias Osc.	50C5
V4	Rectifier	35W4

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA CONCORD PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	G-25017	PRS2195	BBRD4415	TCD48	TDLD-7	TVA-2445	
B	40	150							
C2	5	150		SRE150V5	NLW5-150	TC40	TD-4-150	TVA-1403	
C3	5	150		SRE150V5	NLW5-150	TC40	TD-4-150	TVA-1403	
C4	30	6		PTT27	NLW30-6	TT6X30	MLV30-6	TE-1092	

FIXED CAPACITORS

ITEM No.	RATING	REMARKS	REPLACEMENT DATA AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ELMENCO PART No.	MALLORY PART No.	SPRAGUE PART No.
C5	150 5%		NPO-SI 150	TCZ-150	22R5T15	CM-19B-151J	CNO-315	MS-315
C6	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C7	.0033 400V		P488N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C8	.0022		SI 2200	D6-222	BYA10D22	CCD-222	B-222	5HK-D22
C9	.033 400V		P488N-033	DD-303	CUB6S33	4DP-2-333	GEM-4133	6TM-S33
C10	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C11	330 10%			D6-331	L10T33	CCD-331	GP333	10TS-T33
C12	.01 400V		P488N-01	D6-103	CUB4S1	4DP-1-103	GEM-411	4TM-S10
C13	68 10%		NPO-SI 68	D6-680	L10Q68	CCD-680	GP468	10TS-Q68
C14	420 3%					CM-15E-431G		MS-343
C15	.004 400V		P488N-004	D6-402	CUB6D4	6DP-1-402	GEM-624	6TM-D40
C16	.0047 10%		1464-0047		1R5D47	CM-19B-472K	MCJ464	10TS-D47
C17	.0022 400V		P488N-0022	D6-222	CUB6D22	6DP-1-222	GEM-6222	6TM-D22
C18	.001		SI 1000	D6-102	BYA10D1	CCD-102	B-210	5HK-D10
C19	.0047 400V		P488N-0047	D6-472	CUB6D47	6DP-1-472	GEM-6247	6TM-D47
C20	.0033 400V		P488N-0033	D6-332	CUB6D33	6DP-1-332	GEM-6233	6TM-D33
C21								
C22	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47
C23	.0047		BPD-0047	DD-472	BYA10D47M	CCD-472	B-247	5HK-D47

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA CONCORD PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	CTS-IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	G36203	AB-60				Volume
B	Shaft			AK-29				
C	Switch			KR-2				Power Off-On
R2	65K	½	G-36215					Indicator Level Adjust

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R3	470K			
R4	22K			
R5	3.3meg			
R6	100K			
R7	3.3meg			
R8	100K			
R9	100K			
R10	1000Ω 5%			
R11	100K			
R12	.470K			
R13	200Ω			
R14	1000Ω			

RESISTORS (cont)

ITEM No.	RATING	REPLACEMENT DATA IRC PART No.	WORKMAN TV PART No.	REMARKS
R15	100K			
R16	220K			
R17	100K			
R18	33K			
R19	150K			
R20	10K			
R21	470K			
R22	180Ω			
R23	10K			
R24	220K			
R25	56K			
R26	3300Ω			
R27	250Ω 2W			
R28	5Ω 2W			
R29	33K			

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA CONCORD PART No.	Merit PART No.	Miller PART No.	Stancor PART No.	Workman TV PART No.	NOTES
L1	Bias Osc.	G16031					

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	REPLACEMENT DATA CONCORD PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	117V ⓐ .56A Tap ⓐ 100V ⓐ .150ADC Tap ⓐ 10V	120V ⓐ .040A Tap ⓐ 15V		①					① Used for Drive Motor

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA CONCORD PART No.	QUAM PART No.	NOTES
SP1	4"	PM	8-10Ω	A-45225	4A07RZ9	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA CONCORD PART No. FUSE	CONCORD PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1		2A						

MISCELLANEOUS

ITEM No.	PART NAME	CONCORD PART No.	NOTES
M2	Head	A46028	Erase
M3	Head	A46030	Record-Play
M4	Switch	A42533	Record-Play (Slide Type)
M5	Switch	A42203	Equalizer (Leaf Type)
M6	Switch	A42203	Muting (Leaf Type)

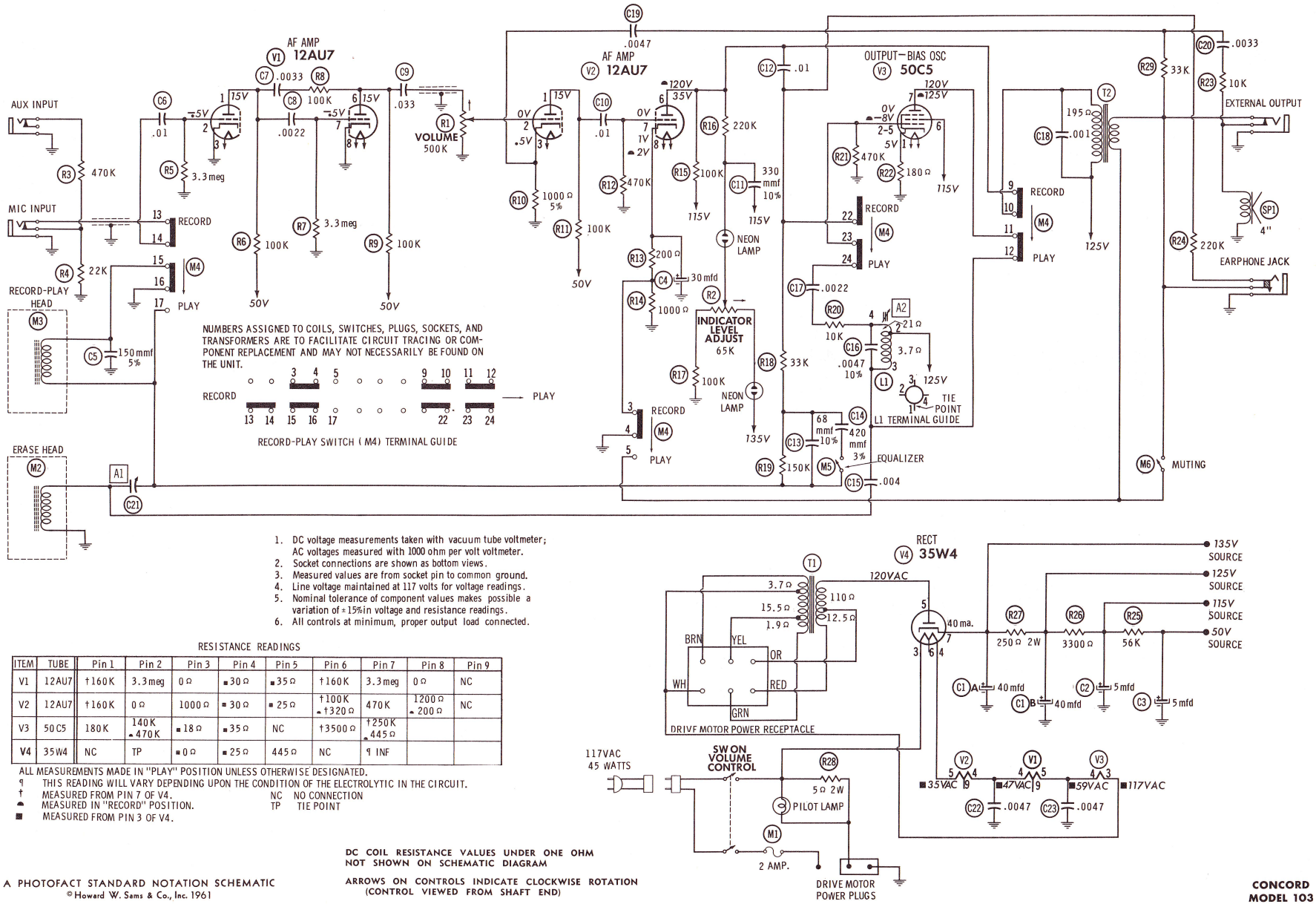
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting) .....Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured with 1000 ohm per volt voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common ground.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AU7	†160K	3.3meg	0Ω	■30Ω	■35Ω	†160K	3.3meg	0Ω	NC
V2	12AU7	†160K	0Ω	1000Ω	■30Ω	■25Ω	†100K ◓†320Ω	470K	1200Ω ◓200Ω	NC
V3	50C5	180K	140K ◓470K	■18Ω	■35Ω	NC	†3500Ω	†250K ◓445Ω		
V4	35W4	NC	TP	■0Ω	■25Ω	445Ω	NC	¶ INF		

ALL MEASUREMENTS MADE IN "PLAY" POSITION UNLESS OTHERWISE DESIGNATED.
¶ THIS READING WILL VARY DEPENDING UPON THE CONDITION OF THE ELECTROLYTIC IN THE CIRCUIT.
† MEASURED FROM PIN 7 OF V4.
◓ MEASURED IN "RECORD" POSITION.
■ MEASURED FROM PIN 3 OF V4.
NC NO CONNECTION
TP TIE POINT

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

A PHOTOFACT STANDARD NOTATION SCHEMATIC

CONCORD MODEL 103

CONCORD MODEL 103